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IS 3459 (2004): Small Wire Ropes [MED 10: Wire Ropes and Wire Products]



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“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक
पतली तार की रस्सियाँ — विशिष्टि
(दूसरा पुनरीक्षण)

Indian Standard
SMALL WIRE ROPES — SPECIFICATION
(*Second Revision*)

ICS 77.140.65

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Wire Ropes and Wire Products Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was originally published in 1966 and revised in 1977.

In the first revision, the following changes were made:

- a) The following constructions were added in view of their increased use:
 - 1) 6×37 (18/12/6-1)
 - 2) 17×7 (6-1)
 - 3) 18×7 (6-1)
- b) The following constructions were deleted because of their limited use:
 - 1) 6×12 (12-fibre)
 - 2) 6×24 (15/9-fibre)
- c) The requirements common to various types of wire ropes were deleted and a reference was made to IS 6594 : 1977 'Technical supply conditions for wire ropes and strands (first revision)'.
- d) Breaking load of wire ropes manufactured from steel wires of tensile designation 1960 was added.
- e) Provision of supplying the wire ropes with wires strand core (WSC) was made.

In this revision, the following important changes have been made:

- a) Designation of various construction of wire ropes have modified in line with IS 6594 : 2001 'Technical supply conditions for steel wire ropes and strands (*second revision*)'.
- b) $6 \times 26\text{SW}$, $6 \times 31\text{SW}$ and $6 \times 36\text{SW}$ constructions have been included under one group in this standard, considering the market demand.
- c) Provision for use of soft fibre (jute) core is also included.
- d) Mass and breaking force given in various tables have been modified as per the revised mass factor (K) and breaking force factor (K') given in IS 6594.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SMALL WIRE ROPES — SPECIFICATION

(Second Revision)

1 SCOPE

This standard covers the requirements for small wire ropes for general purposes. The following rope constructions, types, rope grades, cores and range of sizes are included in this standard as identified by 'x' mark:

4 ROPE SIZE AND TOLERANCE

The size of the rope designated as nominal diameter shall be one of those given in Tables 1 to 5. The actual diameter of the rope shall be within the specified tolerances shown in respective tables.

Construction (1)	Type (2)	Rope Grade		Core		Size Range (Dia) mm (7)	Ref to Table (8)
		1770 (3)	1960 (4)	Fibre (5)	Steel (6)		
6 × 7 (6-1)	Round strand	x	x	x	x	2 – 7	1
6 × 19 (12/6-1)		x	x	x	x	3 – 7	2
6 × 37 (18/12/6-1)		x	x	x	x	6 – 7	3
6 × 26 SW (10-5+5-5-1)		x	x	x	x	6 – 7	4
6 × 31 SW (12-6+6-6-1)		x	x	x	x	6 – 7	4
6 × 36 SW (14-7+7-7-1)		x	x	x	x	6 – 7	4
17 × 7 [11 × 7 (6-1) : 6 × 7 (6-1)]	Multi round strand rotation resistant	x	x	x	x	6 – 7	5
18 × 7 [12 × 7 (6-1) : 6 × 7 (6-1)]		x	x	x	x	6 – 7	5

2 REFERENCES

The following standards contain provisions, which through reference in this text constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	Title
1804 : 1996	Steel wire ropes — Fibre main cores — Specification (<i>third revision</i>)
1835 : 1976	Specification for round steel wire for ropes (<i>third revision</i>)
2363 : 1981	Glossary of terms relating to wire ropes (<i>first revision</i>)
6594 : 2001	Technical supply conditions for steel wire ropes and strands (<i>second revision</i>)

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 2363 shall apply.

5 MINIMUM BREAKING FORCE

Minimum breaking force of ropes shall be as given in Tables 1 to 5.

6 GENERAL REQUIREMENTS

The wire rope shall conform to IS 6594 and shall also meet the requirements given in 6.1 to 6.5.

6.1 Core

6.1.1 Fibre Core

Use of soft fibre (jute) core as per IS 1804 is also permitted.

6.1.2 Steel Core

Where steel core is used, the construction shall be that of strand (CWS).

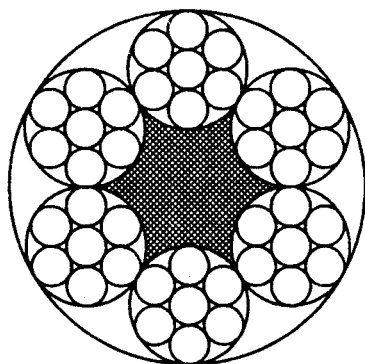
6.2 Joints

Tucked joints in wires during rope making are permitted for wires of 0.5 mm diameter and smaller.

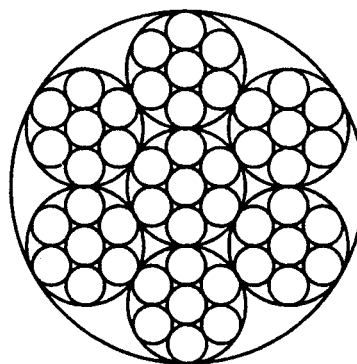
6.3 Lay

The lay of the rope shall be right hand ordinary lay.

Table 1 Breaking Force and Mass for 6×7 (6-1) Construction Ropes
(Clauses 4, 5 and 6.4)



6x7 (6-1)+CF



6x7 (6-1)+CWS

Nominal Diameter	Tolerance on Nominal Diameter	Approximate Mass		Minimum Breaking Force Corresponding to Rope Grade of			
				1770		1960	
		Fibre Core (CF)	Steel Core (CWS)	Fibre Core (CF)	Steel Core (CWS)	Fibre Core (CF)	Steel Core (CWS)
mm	Percent	kg/100 m	kg/100 m	kN	kN	kN	kN
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2	+7 -1	1.43	1.57	2.4	2.5	2.6	2.8
3	+7 -1	3.22	3.54	5.3	5.7	5.9	6.3
4	+6 -1	5.72	6.29	9.4	10.2	10.4	11.3
5	+6 -1	8.94	9.83	14.7	15.9	16.3	17.6
6	+5 -1	12.9	14.2	21	23	23	25
7	+5 -1	17.5	19.3	29	31	32	34

NOTE — To calculate the aggregate breaking force, multiply the figures in col 5 and 7 by 1.111 and in col 6 and 8 by 1.193.

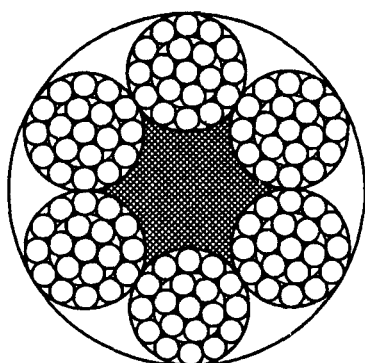
6.4 Mass

The approximate rope masses given in Tables 1 to 5 are of fully greased ropes. The ropes that are not lubricated may be lighter.

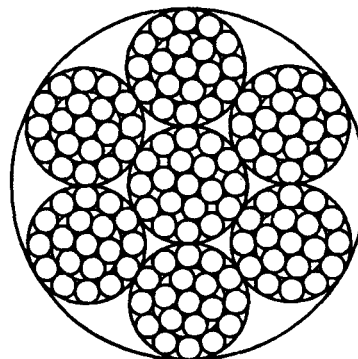
6.5 Preforming

All ropes except those of multi round strand rotation resistant ropes shall be preformed unless otherwise agreed to between the purchaser and the manufacturer.

Table 2 Breaking Force and Mass for 6 × 19 M (12/6-1) Construction Ropes
(Clauses 4, 5 and 6.4)



6x19 M(12/6-1)+CF



6x19 M(12/6-1)+CWS

Nominal Diameter	Tolerance on Nominal Diameter	Approximate Mass		Minimum Breaking Force Corresponding to Rope Grade of			
		Fibre Core	Steel Core	1770		1960	
mm	Percent	(CF)	(CWS)	Fibre Core (CF)	Steel Core (CWS)	Fibre Core (CF)	Steel Core (CWS)
(1)	(2)	kg/100 m	kg/100 m	kN	kN	kN	kN
(3)	(4)	(5)	(6)	(7)	(8)		
3	+7 -1	3.11	3.43	4.9	5.3	5.4	5.9
4	+6 -1	5.54	6.09	8.7	9.4	9.6	10.4
5	+6 -1	8.65	9.52	13.6	14.7	15.1	16.3
6	+5 -1	12.5	13.7	19.6	21	22	23
7	+5 -1	17.0	18.6	27	29	30	32

NOTE — To calculate the aggregate breaking force, multiply the figures in col 5 and 7 by 1.163 and in col 6 and 8 by 1.25.

7 GALVANIZING

When required, galvanizing shall conform to Type B of IS 1835 unless specified otherwise by the purchaser.

8 MARKING

8.1 The size, construction, rope grade, lay, core, coating and length of wire rope, reel/coil number along with the order number of purchaser and any other marking which may be specified by the purchaser shall be legibly mentioned on a suitable tag securely attached, when wire ropes are supplied in coils. In case wire ropes are supplied in reels, the information may be stenciled on both sides of the reels or stenciled on

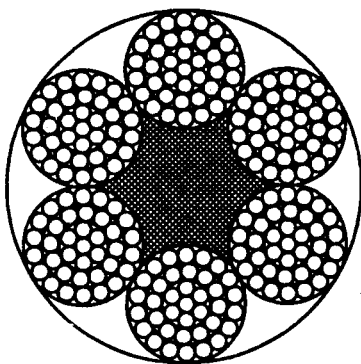
one side of the reel and a suitable tag giving the same information may be attached on the other side of the reel.

8.2 BIS Certification Marking

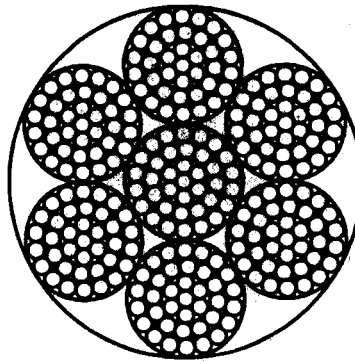
The product may also be marked with the Standard Mark.

8.2.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which a license for the use of the Standard Mark may be granted to the manufacturers or the producers may be obtained from the Bureau of Indian Standards.

Table 3 Breaking Force and Mass for 6 × 37 M (18/12/6-1) Construction Ropes
(Clauses 4, 5 and 6.4)



6x37 M(18/12/6-1)+CF

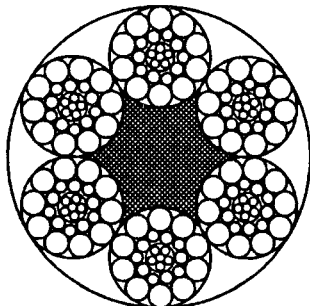


6x37 M(18/12/6-1)+CWS

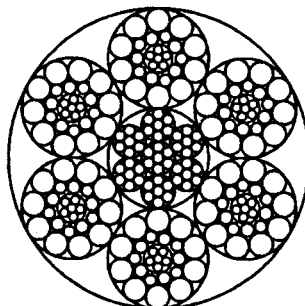
Nominal Diameter	Tolerance on Nominal Diameter	Approximate Mass		Minimum Breaking Force Corresponding to Rope Grade of			
		Fibre Core	Steel Core	1770		1960	
		(CF)	(CWS)	Fibre Core	Steel Core	Fibre Core	Steel Core
mm	Percent	kg/100 m	kg/100 m	(CF)	(CWS)	(CF)	(CWS)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
6	+ 5 - 1	12.5	13.7	18.8	20	21	22
7	+ 5 - 1	17.0	18.6	26	28	28	31

NOTE — To calculate the aggregate breaking force, multiply the figures in col 5 and 7 by 1.212 and in col 6 and 8 by 1.302.

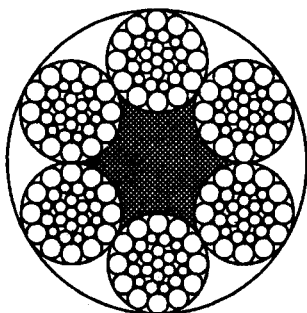
Table 4 Breaking Force and Mass for 6 × 26 SW (10-5+5-5-1), 6 × 31 SW (12-6+6-6-1) and 6 × 36 SW (14-7+7-7-1) Construction Ropes
(Clauses 4, 5 and 6.4)



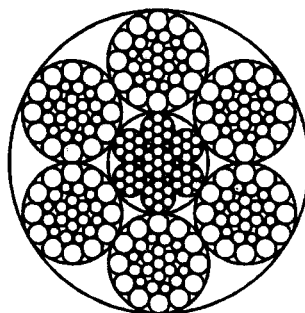
6x26 SW(10-5+5-5-1)+CF



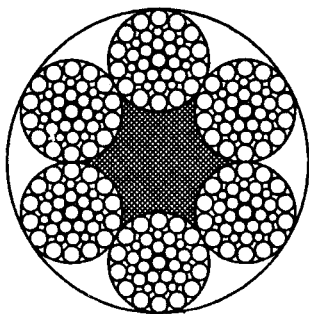
6x26 SW(10-5+5-5-1)+CWS



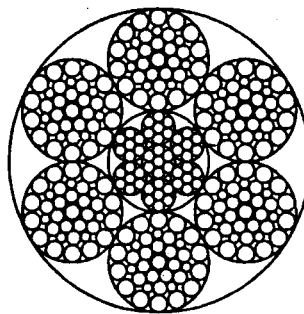
6x31 SW(12-6+6-6-1)+CF



6x31 SW(12-6+6-6-1)+CWS



6x36 SW(14-7+7-7-1)+CF

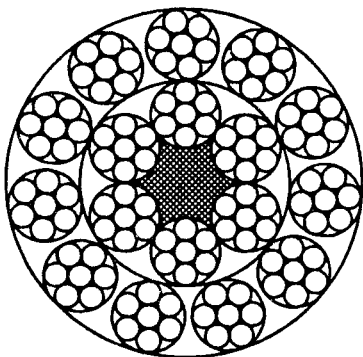


6x36 SW(14-7+7-7-1)+CWS

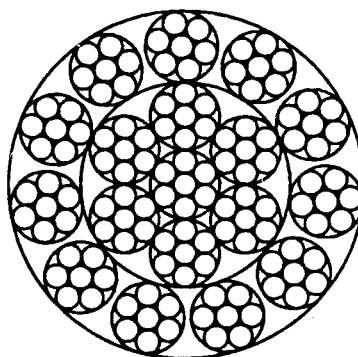
Nominal Diameter	Tolerance on Nominal Diameter	Approximate Mass		Minimum Breaking Force Corresponding to Rope Grade of			
		Fibre Core (CF)	Steel Core (CWS)	1770		1960	
				Fibre Core (CF)	Steel Core (CWS)	Fibre Core (CF)	Steel Core (CWS)
mm	Percent	kg/100 m	kg/100 m	kN	kN	kN	kN
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
6	+ 5 - 1	13.7	15.1	21	23	23	25
7	+ 5 - 1	20.5	20.5	29	31	32	34

NOTE — To calculate the aggregate breaking force, multiply the figures in col 5 and 7 by 1.191 and in col 6 and 8 by 1.28.

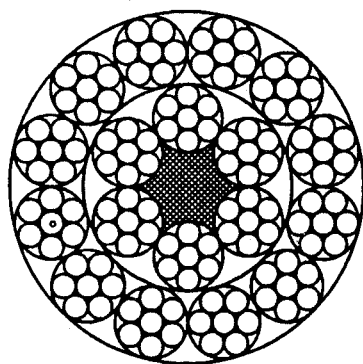
Table 5 Breaking Force and Mass for $17 \times 7 [11 \times 6 (6-1) : 6 \times 7 (6-1)]$ and $18 \times 7 [12 \times 6 (6-1) : 6 \times 7 (6-1)]$ Construction Ropes
(Clauses 4, 5 and 6.4)



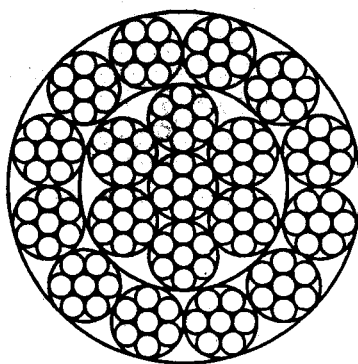
$17 \times 7 [11 \times 7 (6-1) : 6 \times 7 (6-1)] + CF$



$17 \times 7 [11 \times 7 (6-1) : 6 \times 7 (6-1)] + CWS$



$18 \times 7 [12 \times 7 (6-1) : 6 \times 7 (6-1)] + CF$



$18 \times 7 [12 \times 7 (6-1) : 6 \times 7 (6-1)] + CWS$

Nominal Diameter	Tolerance on Nominal Diameter	Approximate Mass		Minimum Breaking Force Corresponding to Rope Grade of			
				1770		1960	
		Fibre Core (CF)	Steel Core (CWS)	Fibre Core (CF)	Steel Core (CWS)	Fibre Core (CF)	Steel Core (CWS)
mm	Percent	kg/100 m	kg/100 m	kN	kN	kN	kN
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
6	+5 -1	13.8	14.5	20	21	22	23
7	+5 -1	8.8	19.7	28	28	31	32

NOTE — To calculate the aggregate breaking force, multiply the figures in col 5 and 7 by 1.282 and in col 6 and 8 by 1.319.

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This Indian Standard has been developed from Doc : No. ME 10 (736).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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